

to speak too highly. Of his fine, manly figure; his frank, open countenance; his clear, honest, kindly eyes; his disposition, genial but firm; his humour, devoid of cynicism; his loyalty to his friends; his gentleness even to opponents, all who had the privilege of knowing him will for ever retain a bright remembrance. As a writer in the *Scotsman* truly says:—"To the University and to science his death is nothing short of a calamity, while to his friends it has brought a sense of desolation."

He was interred on Saturday afternoon at Edinburgh. His remains were escorted from the Church of St. Cuthbert by a long line of students, colleagues, representatives of learned societies, and personal friends, the melancholy procession offering a strong contrast to the gaiety of the city, the traffic of which was arrested by its passage. He lies in the beautiful Dean Cemetery, than which few places contain more distinguished dust. *Requiescat in pace.*

#### DR. G. F. DEACON.

THE death of Mr. G. F. Deacon, a member of the council of the Institution of Civil Engineers, and eminent for his scientific work in engineering, was announced in last week's *NATURE*. Mr. Deacon, during his comparatively short life—he died at the age of sixty-six—obtained a considerable reputation as a water-works engineer, and is best known by his connection with the Vyrnwy Reservoir for the supply of Liverpool. In 1876 the need had arisen for an additional supply of water, and Mr. Deacon, who was then acting as municipal and water engineer, was instructed by the corporation to make an investigation as to the locality from which an additional supply could be obtained. After a survey of several sources he finally advised that this could be best obtained from the River Vyrnwy, a tributary of the Severn, situated in North Wales. Mr. Deacon's recommendation was submitted to Mr. Thomas Hawksley and Mr. Bateman, who approved this choice. The Bill promoted by the corporation having received the sanction of Parliament, Mr. Deacon was appointed joint engineer with Mr. Hawksley to prepare the plans and carry out the work. When the works were about half finished, Mr. Hawksley retired, and Mr. Deacon was left in sole charge.

The Vyrnwy works are remarkable as having the largest reservoir in England, and the first to have a high water-tight masonry dam. This dam was formed with blocks of clay slate from the Caradoc beds of the lower Silurian formation, some of which weighed 10 tons. These were set in mortar composed of Portland cement and slate stone crushed fine enough to pass through meshes of one-eighth of an inch. The dam is 1350 feet long, 136 feet high, and impounds the water in a reservoir 5 miles long and covering 1121 acres. The cost of these works was 2½ million pounds, and they were carried out under Mr. Deacon's supervision without the aid of a contractor. A full account of the Vyrnwy works is given in a paper read by Mr. Deacon at the Institution of Civil Engineers in 1896, and contained in vol. cxxvi. of the Minutes of Proceedings.

Mr. Deacon was educated at the Glasgow University, which subsequently conferred upon him the honorary degree of LL.D. He served his time in Napier's shipyard, which led to his becoming one of Lord Kelvin's assistants on the *Great Eastern* when an attempt was made to lay an Atlantic cable. At the age of twenty-two he commenced practice as an engineer at Liverpool, and six years afterwards was appointed municipal and water engineer of that borough. One of the most important services he ren-

dered during this time was the invention of the waste-water meter, by means of which it became possible to locate the place where leakage and waste were going on in the mains or from the service pipes, and thus a very great saving was effected in the quantity of water required. He also devised considerable improvements in the instruments used for measuring the velocity of the flow of water in rivers, and applied the use of electrical mechanism to current meters. He took keen interest in devising and improving the means of making the meteorological observations necessary for determining the yield of rain water.

In 1879 Mr. Deacon resigned his appointment as municipal engineer in order to devote his whole time to the Vyrnwy works. On the completion of these he commenced to practise at Westminster as a consulting engineer, and was connected with many important schemes of water supply, and frequently was engaged in giving evidence before parliamentary committees. In addition to his work as a water-works engineer, Mr. Deacon applied a considerable amount of attention to the application of scientific principles to the solution of problems arising out of the practical work of the engineer.

Mr. Deacon was president of the engineering section of the British Association at the meeting held at Toronto in 1897, also of the Municipal and County Engineers at their meeting in 1878. He was a Fellow of the Meteorological Society, and a member of the Institution of Mechanical Engineers.

#### NOTES.

THE list of honours announced on the occasion of the celebration of the King's birthday on Friday last includes the names of five Fellows of the Royal Society. Mr. Francis Galton, F.R.S., Prof. J. Larmor, F.R.S., Mr. R. H. I. Palgrave, F.R.S., and Prof. T. E. Thorpe, F.R.S., have received the honour of knighthood, and Dr. W. Schlich, F.R.S., has been appointed a Knight Commander of the Order of the Indian Empire (K.C.I.E.). Other men of distinction in the scientific world included in the list are:—Mr. Edgar Thurston, superintendent of the Government Central Museum, Madras, appointed a Companion of the Order of the Indian Empire (C.I.E.); Prof. W. J. R. Simpson, a Companion of the Order of St. Michael and St. George (C.M.G.); Sir Dyce Duckworth and Mr. Henry Morris, president of the Royal College of Surgeons, have had baronetcies of the United Kingdom conferred upon them; and Mr. James Stuart, who founded the system of university extension and the mechanical workshops at Cambridge, has been made a privy councillor.

ON Monday evening Mr. E. H. Shackleton delivered his first lecture since his return home on the results of his South Polar expedition at a special meeting of the Royal Geographical Society in the Royal Albert Hall. The main facts of the expedition have already been recorded in our own columns and elsewhere, but a large and brilliant audience assembled to hear from the explorer's own lips an account of the experiences of his companions and himself during their fourteen months' sojourn within the Antarctic circle. It is not always easy to realise the meaning of distances between places the position of which is only known in terms of latitude and longitude, and Major Leonard Darwin, who presided over the meeting, performed a useful service for his audience by indicating the extent of ground which would have to be covered by a party starting from London northwards on a journey of the same length as that which took Mr. Shackleton

from his winter quarters to within 100 geographical miles of the South Pole. The party would have to march so far as Edinburgh before reaching Captain Scott's record, and onwards to a point 240 miles beyond John o' Groats before reaching the limit of the journey. Mr. Shackleton told his story in a simple and graphic manner, which revealed, without unduly emphasising, the hardships and dangers experienced by his companions and himself on the great southern journey, and by the party under Prof. David which reached the South Magnetic Pole. The Lloyd-Creak dip-circle, he mentioned, worked remarkably well under the severe climatic conditions. The lecture was illustrated by a number of very interesting photographs, while at the close there was a display of "living pictures"—the first ever taken in the Antarctic regions—which afforded a very good idea of the movements of penguins and seals. One scene, which Mr. Shackleton will be well advised to omit in future, illustrated the death of a seal shot by the explorers. After the lecture the Prince of Wales, on behalf of the Royal Geographical Society, presented to Mr. Shackleton a special gold medal, and to a number of other members of the expedition replicas of the medal in silver.

THE next meeting of the French Association for the Advancement of Science will be held at Lille from August 2-7. The secretary of the association should be addressed at 28, rue Serpente, Paris.

THE annual meeting of the Association for the Oral Instruction of the Deaf and Dumb will be held at the Portman Rooms, Baker Street, W., on Tuesday, July 13. Lord Avebury will preside.

MR. F. MUIR and Mr. J. C. Kershaw send home, under date March 12, a description of a *Peripatus* which they have recently found in Ceram. This is the first time that *Peripatus* has been found in the Moluccas. The specimens, sixty-three in number, were all females. "In the size of its eggs (0.05 mm.) and in its mode of development and birth it approaches the neotropical group." In its other characters it appears to resemble *Melano-Peripatus* (the New Britain species found by Dr. Willey). The authors name the species *Peripatus ceramensis*. A description of it, with illustrations, will be published in the forthcoming number of the *Quarterly Journal of Microscopical Science*.

THE issues of the *British Journal of Photography* for June 18 and 25 contain a detailed account of a noteworthy collection of apparatus intended for the easy demonstration of certain optical and visual phenomena specially interesting to photographers. The apparatus, which was designed by Dr. E. Goldberg, of Leipzig, and is now on view at the International Exhibition of Photography at Dresden, is arranged in forty-four small cabinets. Each cabinet is fitted with the requisites for a single experiment, and is accompanied by printed instructions briefly stating the result to be looked for, and indicating the necessary manipulation, which is in every case so simple that the merest tyro can hardly fail of success. The points illustrated include defects of the eye, such as irradiation, chromatic aberration, the blind spot, and Purkinje's figures; various subjective phenomena of colour; some effects of intermittent illumination; elementary examples of reflection, refraction, dispersion, diffraction, and absorption; colour mixture, with special regard to the devices employed in the modern processes of colour photography.

DURING the course of the discussion on cable rates and Press intercommunication in connection with the Imperial Press Conference, Mr. Marconi gave some interesting

information. He remarked it would be injudicious for the Governments concerned to enter into a scheme of State-owned cables without first having investigated the capabilities of a wireless connection between the two countries. In discussing these connections, he said, we should refer to electric communication instead of cable communication. The cost of two stations capable of communicating over distances which have proved practicable—3000 miles—would be about 50,000l. for each station. This estimate, of course, is subject to variation. He is, he continued, certainly of opinion that it may be possible in the near future to communicate over greater distances, perhaps 6000 miles, or even more. There is a very interesting theoretical point about communicating a distance of 6000 miles, which is that when the equator is passed the wireless waves may begin to converge again, and it may occur that at the Antipodes messages can be received much easier than half-way to the Antipodes. That remains to be proved. At present the Marconi Company is prepared to take a limited amount of Press messages across the Atlantic at 2½d. per word. When the stations are completed it is hoped to take a large amount—15,000 or 20,000 words a day. If the amount is considerable the company would be prepared to give a service at 2d. a word from Canada to England.

THE new buildings of the Victoria and Albert Museum, South Kensington, were opened in State by the King on June 26. Mr. Runciman, President of the Board of Education, read an address, in which, on behalf of the Board, he thanked the King and Queen for consenting to open the new buildings, and explained the numerous uses of the museum. The address showed that the first object of the founders of the museum was to encourage a high standard of excellence among the craftsmen, manufacturers, and designers of this country. For many years lack of space prohibited a systematic arrangement and classification of the collections. The completion of the new buildings now makes it possible to display the collections in a manner worthy of the ambition which prompted their formation. With this object in view the Board of Education has formulated a scheme for the future organisation and management of the museum. The collections are classified in eight departments. Each department will have its own expert staff, while a separate staff will have charge of the supplementary collections intended for loans to provincial museums and schools of art. In the course of his reply the King said:—"The placing of an expert staff in charge of each section of the museum will have the double advantage of maintaining and developing the more scientific arrangement which has now become possible, and also of bringing about a more accurate knowledge of the history and beauty of the individual exhibits, and of their educational value."

THERE has, so far, been an entire absence of summer weather, and June has proved wet, cold, and almost sunless over the United Kingdom. In England the weather has been especially bad, and the aggregate rainfall is largely in excess of the average. In London the total measurement of rain, not including yesterday, June 30, was 4.29 inches, whilst the average for the month is 2.21 inches. The duration of bright sunshine is only eighty-seven hours, the average for the month being 167 hours, and in some recent years June has had 240 hours of sunshine; in May the sun was shining brightly in London for 297 hours. At Greenwich there have only been three days with the shade temperature above 70°, and there is only one year, 1860, with so few warm days in June during the last sixty-eight years. In June last year

there were seventeen days with the temperature above 70°, and in May of the present year there were ten such warm days, the thermometer exceeding 80° on three days, whilst in June the highest temperature was 74°.

THE latest contribution of Prof. W. Trelease to the elucidation of the genus *Agave*, published in the Transactions of the Academy of Science of St. Louis (vol. xviii., No. 3), deals with the Mexican species yielding fibre known as "Zapupe." Although in three cases flowers were not obtainable, five botanical species with local names are distinguished primarily according to the characters of the spines. The species *Zapupe*, *Lespinassei*, *Deweyana* are only known in cultivation, but *Endlichiana* and *aboriginum* are indigenous. Bulbils are described for two species, and it is stated that all appear to be freely bulbiferous after flowering, thus affording "pole" plants as well as offsets.

THE list of new garden plants for 1908, issued, according to precedent, as appendix iii. of the *Kew Bulletin* (1909), has only recently been received. It furnishes the correct names with brief diagnoses, gives the reference to the original publication and the introducer, and also indicates which plants are in cultivation at Kew and would probably be available for distribution in the regular course of exchange. About one-third of the entries refer to orchidaceous plants, many being garden hybrids, and others mere varieties or forms. Two natural and several garden hybrids are noted under the genus *Saxifraga*. Messrs. Sanders are credited with the introduction of three palms and the cycad *Encephalartos Woodii*.

AN investigation of the medullary rays in the beech, the oak and *Aristolochia sipho*, with the object of tracing the contour of the rays, has been carried out by Dr. K. Zijlstra, who communicates his results in *Extrait du Recueil des Travaux botaniques Néerlandais* (vol. v.). The contours of the rays in the oak and beech obtained by a comparison of tangential sections are fairly regular, being interrupted in places by fibre layers. They show an irregular but distinct increase in height towards the cambium. The height of the rays in *Aristolochia* stems approximates to the length of the internodes, if, as is assumed, the separate overlying portions are regarded as part of one original ray.

DR. P. LOWELL contributes to the *Bulletin* of the American Geographical Society (May) the first portion of a description of the plateau of the San Francisco peaks with reference to its effect on tree life. The peaks, which are for the most part cones of volcanic origin, rise out of a plateau having an elevation of 7000 feet. The desert nature of the region has kept it free from human destruction and the dry climate has preserved in a remarkable manner the fossil remains. The altitudinal distribution of the trees forms the chief subject of the paper. The zones of vegetation are said to topographise the country as with contour lines. The yellow pine, *Pinus ponderosa*, dominates the slopes from 6500 feet to 8500 feet. Then the Douglas fir, the silver fir, *Abies concolor*, the curious cork fir, *Abies subalpina*, and the aspen share the ground up to an elevation of 10,300 feet. Higher still, the Engelmann spruce and fox-tail pine, *Pinus aristata*, ascend to the tree limit, about 11,500 feet.

MR. J. PARKINSON contributes to the last number of the *Journal of the African Society* a collection of folktales current among the Yoruba-speaking peoples, which form an interesting supplement to the classical account of this people by the late Major Ellis. Like the Basutos, Pondos, and races beyond the African area, lightning is

associated with a bird, and the thunderbolt is the subject of a special cult. The tortoise as the wise, helpful animal here takes the place of the hare, jackal, or frog in Bantu and Basuto tradition, several tales dealing with his cleverness and supplying etiological myths to account for the various marks still to be seen on his carapace.

IN the June number of *Man* the Rev. J. Roscoe describes a remarkable cult of the python at Uganda. The floor of its shrine was found to be carpeted with sweet-smelling grass, and on one side was the sanctuary of the serpent and its guardian, the latter being a woman pledged to a life of celibacy. A log and stool for the python, covered with a piece of bark-cloth, lay on the floor of the shrine, and a round hole was cut in the wall for the ingress and egress of the reptile. It had been trained to resort to this shrine, where it was regaled with milk, fowls, and small goats. The snake is supposed to control the river and its fish, and offerings are made to it to ensure success in fishing. During worship a medium is dressed in pieces of bark-cloth, a goat-skin apron, and a cloak of leopard skin. The spirit of the python then is supposed to enter him, when he wriggles about on the ground like a snake and utters prophecies, which are unintelligible to the worshippers, and are explained by an interpreter. The python is also supposed to confer offspring, and if he be neglected punishes his votaries by bringing sickness on their children. When a suitable offering is presented he prescribes the use of certain herbs, which effect a cure. The cult thus presents striking analogies to that of *Æsculapius*, who, according to Prof. J. G. Frazer, was originally a serpent, the anthropomorphic god provided with a serpent symbol being a later development of the cult.

MISS NINA LAYARD, already well known for her researches in the Saxon cemetery at Ipswich, describes in the June number of *Man* a series of flint implements discovered by her on the sea-coast at Larne, co. Antrim. This site had already been explored by Messrs. Du Noyer, Knowles, and Gray, whose discoveries have led to protracted controversy, and the age and character of the specimens are still matters of uncertainty. They do not correspond closely with either the palæoliths or neoliths of England, and though many acres of land are covered by these raised beaches, nothing in the shape of a ground weapon has been found. The presence of many flints in a rolled condition leads to the inference that they are older than the formation in which they were found, and the occurrence of these specimens, which many authorities hold to be Neolithic, at such enormous depths in gravel is subversive of all English experience. Miss Layard, in the circumstances, is content to designate them "the older series," because since they were dropped on this shore there must have occurred, not only a gradual sinking of the beach and the formation of gravels 20 feet in depth containing the worked flints, but also a subsequent elevation until the surface of the gravel stands no less than 20 feet above high-water mark. In the same connection, the account in the same number by Mr. Worthington G. Smith of a Palæolithic implement found near the British Museum in 1902 is interesting. It is remarkable in this specimen that an oval flint pebble forms part of the basis of the implement, the maker of the tool, by clever flaking, having designedly left this pebble intact.

THE geological section of the Belfast Naturalists' Field Club organised on June 19 an excursion to Scawt Hill for the study of the volcanic neck there. The geological structure of the district is that common to the plateau



basalts of County Antrim, and consists of basic lava flows covering Mesozoic beds, and at Scawt Hill occurs the "neck" of one of the volcanoes from which the lavas came. A few years ago one of the members of the section came unexpectedly on a basic dyke traversing the dolerite neck. The neck has been found to be a fine-grained ophitic dolerite. The dyke is a granitoid basic rock, and may be classed as a diabase without olivine. A section of the chalk taken two yards from the dyke showed it to be converted into a typical crystalline limestone with large crystals of calcite. The geologists of the Belfast Naturalists' Field Club made during the excursion the observation that even at a distance from the dyke the band of chalk in contact with the dolerite neck seemed to have undergone a similar change, and to have been converted into hornstone.

In the *U.S. Monthly Weather Review* of January last references are made to interesting communications by Mr. R. F. Stupart, director of the Canadian Meteorological Service (dated March, 1909), relating (1) to the establishment of new stations in Newfoundland and Labrador, and the proposed extension of storm warnings and weather forecasts to Newfoundland, and (2) to the supply of a complete equipment to several stations in the north of Canada, extending as far as Fort Macpherson (lat.  $67^{\circ} 27'$ , long.  $134^{\circ} 57'$  W.). In connection with the source of "cold waves" frequently experienced in North America, Mr. Stupart thinks that the study of the far north with trustworthy barometer readings will be most valuable. He remarks that the persistent high pressures found there in some seasons apparently owe their origin to upper currents from the equator coming to earth farther north than usual, and that "we may very probably in the future connect the situation in the equatorial regions and trade-wind belts with that in the high latitudes."

The first complete account of the new method which has been adopted by the Gesellschaft für drahtlose Telegraphie to secure an almost undamped series of oscillations in the secondary circuit of the sender is given by Prof. Fleming in the *Electrician* for June 11. The primary spark is divided into eleven very short sparks of about 0.01 inch in length, which are formed between twelve discs of copper, which may be water-cooled. The damping is so great that not more than two or three oscillations occur in the primary circuit, and the oscillations in the secondary are therefore free oscillations, which are only slightly damped. The device evidently marks a distinct advance in wireless telegraphy.

Last year in the *Comptes rendus* and in *Le Radium* M. J. Becquerel described experiments on the electric discharge through vacuum tubes which appeared to indicate that, in addition to the canal rays, there existed positive rays which could be deviated by a magnetic field by amounts comparable with those to be expected if the rays were composed of free positive electrons. In the *Journal de Physique* for June, M. A. Dufour describes his own work on the same subject. He has repeated and extended M. Becquerel's experiments, and comes to the conclusion that the observations do not warrant the statement that the deviable rays observed are due to free positive electrons.

MR. R. H. COLLINGHAM contributes an article in *Engineering* for June 18 dealing with Ilgner-operated winding-engines. The principle of the Ilgner system is the employment of a motor-generator set coupled mechanically to a heavy fly-wheel and electrically to the motor driving the mill or winding gear. The motor of the motor-generator is driven off the power mains, and

the function of the fly-wheel is to minimise the variation in the load drawn from the source of supply. All the heavy loads which come on the mill are met from the store of energy in the fly-wheel. In order to obtain this result, an automatic slip-regulating device is provided in the rotor circuit of the induction motor driving the motor-generator set, which regulates the amount of slip on the induction motor according to the amperes taken by the stator, the slip-regulating device only coming into operation when the stator current has reached a certain fixed value. When this value has been attained the regulating device increases the slip of the induction motor, causing the speed of the set to drop; the fly-wheel then gives up energy corresponding to the given variation in velocity. By this means the load on the supply mains is kept much more steady than would be the case if no fly-wheel were employed. Mr. Collingham treats especially the mechanics of the problems involved with the view of finding expeditiously the weight of wheel, size of motor, &c., required in given cases.

IN our article upon the Astrographic Congress at Paris (June 10, p. 440) it was stated that Rome was represented by Signor Lias. We are asked by Dr. P. Emanuelli to state that this should have been Signor Lais, who is vice-director of the Vatican Observatory, and was the representative, not of Rome, but of the Vatican.

WE have received from Messrs. Flatters and Garnett, Ltd., of Manchester, a copy of their conveniently arranged catalogue of collecting apparatus, nature-study appliances, cabinets, museum glassware, glass-top boxes, pocket lenses, and so on. The list is well illustrated, and reference to its contents is made easily.

MR. JOHN MURRAY has published a second edition of Mr. R. H. Lock's "Recent Progress in the Study of Variation, Heredity, and Evolution." The first issue of the book was reviewed at length in *NATURE* of April 18, 1907 (vol. lxxv., p. 578), but it may be pointed out that several alterations and additions have been made in the present edition. A short list of references has been added at the end of each chapter; the different chapters have been revised and supplemented, and a new chapter has been added.

"A SHORT HISTORY OF ENGLISH AGRICULTURE," by Mr. W. H. R. Curtler, is announced by the Oxford University Press for early publication. As the agriculture of the Middle Ages has often been ably described, Mr. Curtler devotes the greater part of his book to the agricultural history of the subsequent period, especially the seventeenth, eighteenth, and nineteenth centuries.

## OUR ASTRONOMICAL COLUMN.

### ASTRONOMICAL OCCURRENCES IN JULY:—

- July 3. 14h. 30m. Uranus in conjunction with the Moon (Uranus  $2^{\circ} 22'$  N.).
- 7. 17h. Mercury at greatest elongation ( $21^{\circ} 11'$  W.).
- 8. 3h. 46m. Mars in conjunction with the Moon (Mars  $1^{\circ} 21'$  N.).
- 11. 15h. Uranus at opposition to the Sun.
- 15. 14h. Saturn at quadrature to the Sun.
- 18. 17h. 50m. Venus in conjunction with the Moon (Venus  $3^{\circ} 5'$  S.).
- 19. 18h. Mars at greatest heliocentric latitude S.
- 20. 17h. 39m. Jupiter in conjunction with the Moon (Jupiter  $4^{\circ} 22'$  S.).
- 23. 5h. 17m. Mercury in conjunction with Neptune (Mercury  $1^{\circ} 6'$  N.).
- 25. 19h. Mercury in perihelion.
- 30. 22h. 4m. Uranus in conjunction with the Moon (Uranus  $2^{\circ} 16'$  N.).